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HANDBOOK OF CANADIAN SPRING WHEAT VARIETIES

BY

L. H. NEWMAN, J. G. C. FRASER AND A. G. O. WHITESIDE

CEREAL DIVISION
EXPERIMENTAL FARMS SERVICE

Published by authority of the Hon. JAMES G. GARDINER, Minister of Agriculture
Ottawa, Canada

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FOREWORD

The need for definite and precise information concerning the economic qualities and the distinguishing characteristics of the different varieties of spring wheat which, at one time or another, have found their way into cultivation in Canada, is becoming more and more pressing as the number of varieties increases. This need is felt not only by those farmers who wish to grow a variety which is well adapted to their respective conditions but by those officially charged with the inspection of crops for which registration or certification is sought. The plant breeder, the agronomist and the extension man should also be thoroughly familiar with existing varieties and their peculiarities.

Recognising the need for such information, the Cereal Division initiated a systematic study of all varieties of economic interest in the summer of 1924. A brief report covering the work of that year is published elsewhere.* Here reference is made to the attempt to construct a classification or "Key" which might enable one to "run down" or identify a variety of wheat as the botanist uses his key in the identification of a species. It is pointed out that this undertaking was based largely upon the splendid work of Clark, Martin and Ball, of the U.S. Department of Agriculture, Washington, D.C., in their efforts to classify and describe the wheats found in the United States.** Two years later, a second report was presented as a paper before the annual meeting of the Canadian Seed Growers' Association, and duly published.*** In this report, further reference is made to the Key under construction, and to the fact that detailed monographs of each variety would appear later. Since that time, Marquis has been described in detail.† This variety being the most widely grown in Canada at one time and having been taken as the standard of quality in the fixing of the commercial grades, is used very largely in the present publication as a basis of comparison.

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*See Proceedings of the Fifth Annual Meeting of the Western Canada Society of Agronomy, Winnipeg, December, 1924.

**Classification of American Wheat Varieties, Clark, Martin and Ball, U.S. Dept. of Agriculture, Bulletin 1074, Washington, D.C.

***Classification of Canadian Spring Wheat Varieties, by L. H. Newman—Report Canadian Seed Growers' Association, 1926.

†Marquis Wheat—by L. H. Newman and J. G. C. Fraser, Cereal Division, Dominion Experimental Farms, Pamphlet No. 95, New Series.

KEY TO VARIETIES OF THE MORE COMMON HARD RED AND WHITE SPRING WHEATS

KERNELS RED—

- I. Head Absolutely Beardless:—(no tip awns) — Red Bobs Sel. (Red Bobs 222, Early Triumph, Supreme)
- II. Head Beardless (except for short tip awns)
  - Chaff White
    - Chaff Smooth—Marquis, Red Fife, Early Red Fife, Kitchener, Renfrew, Percy, Ruby, Parker's, Garnet, White Russian, Thatcher, Type Ic (Old Fife type), Apex, Renown, Rescue, Redman, Regent
    - Chaff Hairy—Reward, Hayne's Blue Stem
  - Chaff Red or Brown and Smooth—Stanley, Aurore, Vermilion, Montana King (Broatch's Brownhead)
- III. Head Fully Bearded
  - Chaff White
    - Chaff Smooth—Ceres, Preston, Pioneer, Kota, Reliance, Canus, Hard Red Calcutta, Coronation
    - Chaff Hairy—Prelude
  - Chaff Red or Brown and Smooth—Huron, Ladoga

KERNELS WHITE—

- I. Head Absolutely Beardless
- II. Head Beardless (except for short tip awns)
  - Chaff White and Smooth—Axminster, Bishop, Pacific Blue Stem, Quality, White Fife
  - Chaff Red or Brown and Smooth—Federation

Handbook of Canadian Spring Wheat Varieties

THE BASIS OF CLASSIFICATION

The task of properly appraising a variety of wheat and of describing its peculiarities so that it may readily be recognized, requires that it be grown in many widely separated places and under a great variety of seasonal and other modifying conditions. Such conditions are admirably provided by the Dominion Experimental Farms Service with its numerous branch farms and stations scattered from the Atlantic on the East to the Pacific on the West, as well as into the Far North. Here are grown year after year, all varieties regarding which information is sought so that in the course of time, a fund of information regarding the peculiarities of each variety is built up.

In constructing a Classification or Key to facilitate the identification of the spring wheats, a few major groups may first be segregated. Thus, in the Key herewith submitted, all varieties are divided into two groups on the basis of kernel colour—*Red Kernelled* varieties and *White Kernelled* varieties. Each of these two groups is then divided on the basis of awn development into three groups or classes, each of which in turn is subdivided on the basis of colour of glume or chaff. Finally, all these subdivisions are again split into two sections on the basis of the "hairiness" of the glume.

By means of the above arrangement, it is possible to reduce the number of varieties considered to a relatively small group. As a matter of fact, it is not difficult to determine the *group* to which a given variety belongs, but it is often difficult to distinguish the varieties *within* the group. Here, varieties differ from each other in less apparent characteristics, such as in certain glume characters. These, therefore, have to be dealt with in some detail.

Shape of Head or Spike

The shape of the spike is almost entitled to be regarded as of major importance in the classification of spring wheats. In certain varieties, in fact, the spike shape is almost sufficient in itself to indicate the name of the variety. In the case of Reward, the spikelets are usually arranged in "zig-zag" fashion, thus giving to the variety its characteristic "ragged" appearance. This same characteristic is apparent, incidentally, in many hybrid types of which Reward is one of the parents.

Clark, Martin and Ball define four main types of spike as regards shape, viz., *Fusiform* or tapering, *Oblong, Clavate* or "clubbed" and *Elliptical.* Varieties belonging to the *Fusiform* group, taper gradually from the base of the spike to the tip. Marquis is a good representative of this group. Varieties classed as *Oblong* carry their width more uniformly throughout the length of the spike. Renfrew belongs to this group. Spikes which are classed as *Clavate* or clubbed, vary most. Thus, under very favourable conditions, varieties such as Early Red Fife and Kitchener, develop thickened club-shaped tips, whereas under conditions which do not favour the full development of the tip spikelets, these varieties are more oblong in shape. These varieties are not to be confused, however, with those belonging to the true club wheats which are extremely dense and compact throughout.

Density of Spike

The density or compactness of the spike varies considerably in different varieties. The degree of density is described as *lax, mid-dense* and *dense.* Marquis is usually classed as mid-dense whereas such varieties as Renfrew and White Russian, are classed as lax. In the dense group occur such varieties as Aurore.

Awns or Beards

Varieties which do not develop any beards whatsoever are classed as "Absolutely Beardless." Red Bobs is a good representative of this class. Varieties classed as "Beardless" may have short fine awns terminating the lemmas or flowering glumes of the tip spikelets. These "tip awns" differ in length, colour, number and arrangement. Marquis, and in fact the majority of the best varieties at present belong to this "Beardless" class.

The varieties which are classed as "Fully Bearded" are those which have a long awn or beard terminating the lemmas. Ceres is a well known representative of this group.

In some varieties, the colour of the awn is fairly characteristic and is, therefore, a useful distinguishing character.

Chaff or Glume Characters

The colour, hairiness and shape of the outer glume, commonly called the "chaff," constitute exceedingly important characters from the standpoint of distinguishing one variety from another. Thus, as will be noted in the Key, all varieties are either white chaffed or red chaffed. Then the varieties within each of these two groups are either smooth (glabrous) as in Marquis, or hairy (pubescent) as in Reward.

Length and Width of Glume

The length-width ratio of the glume is a character of some importance. In some varieties such as Renfrew, the glume is long in relation to its width, whereas in varieties such as Major, the difference is much less.

Shoulder of Glume

The shoulder is the top or end of the glume, extending from the beak to the opposite margin. It is described by the original authors as narrow, mid-wide and wide (Fig. I) while its shape is described as wanting, oblique, rounded, square, elevated and apiculate (Fig. II).

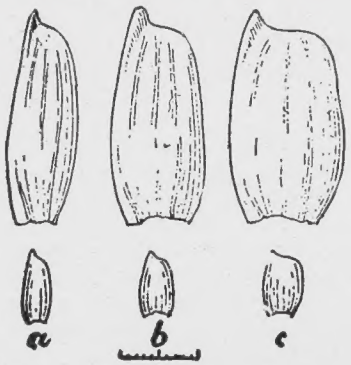

FIG. I—Shoulder widths: a, Narrow; b, mid-wide; c, wide. (Natural size and enlarged 3 diameters.) (After Clark, Martin and Ball.)

The terms used by authorities in the United States have been adopted in the present treatment as they seem to meet all essential needs.

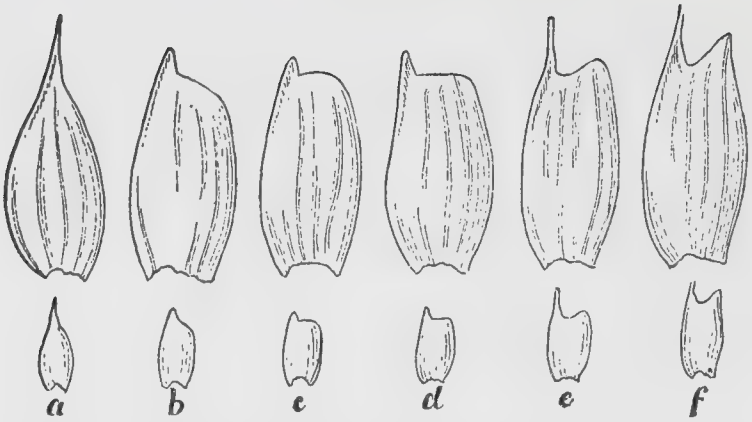

FIG. II—Shoulder Shapes: a, Wanting; b, oblique; c, rounded; d, square; e, elevated; f, apiculate. (Natural size and enlarged 3 diameters.) (After Clark, Martin and Ball.)

Beak of Glume

The projection terminating the keel of the outer glume is called the "beak". These differ appreciably in length and shape. In describing the latter, Clark, Martin and Ball use the terms *obtuse*, *acute* and *accuminate* in describing the shape. It has been found desirable to add an additional term, namely, *oblong* to describe the beaks of certain varieties such as Early Red Fife (see Fig. III).

The *length of beak* is one of the most valuable distinguishing characters in Spring Wheats, as each variety has its own characteristic beak length (Fig. IV).

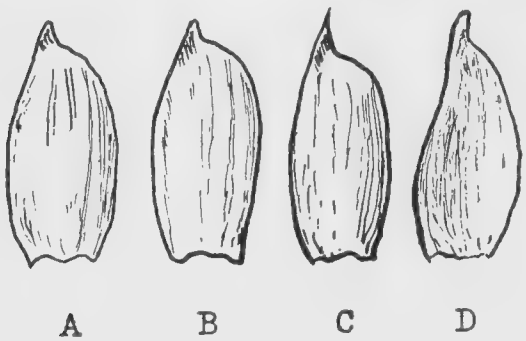

FIG. III—Beak Shapes: A, obtuse; B, acute; C, accuminate; D, oblong. (Adapted from Clark, Martin and Ball.)

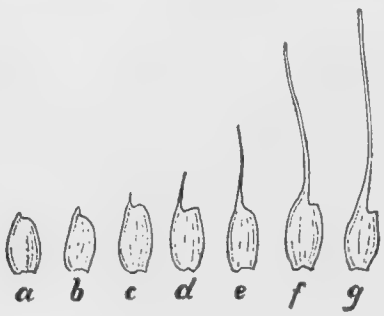

FIG. IV—Beak Lengths, showing seven variations (natural size). (After Clark, Martin and Ball.)

In comparing the glumes of one variety with those of another, it is desirable to choose glumes borne by spikelets occupying the same position on each head. In this connection, it has been found that glumes at the 7th node from the base of the head are usually the most uniform and, therefore, the most reliable. It has also been found that the glume of the two outer spikelets, viz., the primary and the secondary should both be used.

In the accompanying photographs, the glumes of a number of the more distinctive varieties are shown in order to illustrate the different types of glume which characterize different varieties (Figs. V, VI and VII).

FIG. V—Primary and Secondary glumes of the more common hard red spring wheats. (Primary glume on the left in each case.)—1. Red Bobs 222—2. Early Triumph—3. Supreme—4. Marquis—5. Red Fife—6. Ruby—7. Parker's—8. Renfrew—9. Kitchener—10. Early Red Fife—11. Percy—12. White Russian—13. Garnet.

FIG. VI—Primary and secondary glumes of the more common hard red spring wheats. (Primary glume on the left in each case.) 14. Reward—15. Haynes Blue Stem—16. Aurore—17. Stanley—18. Vermilion—19. Broatch Brownhead.

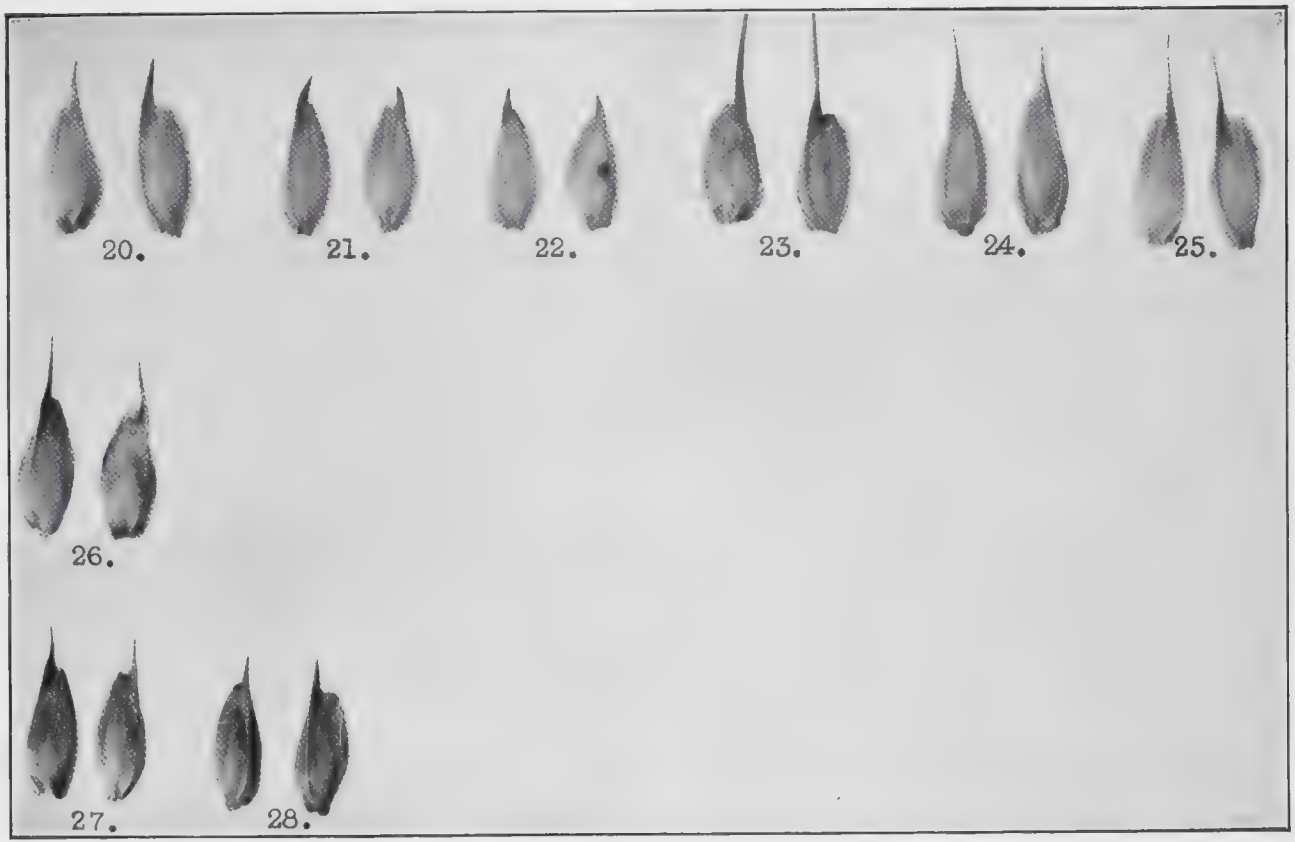

FIG. VII—Primary and secondary glumes of the more common hard red spring wheats. (Primary glume on the left in each case.)—20 Ceres—21. Preston—22. Pioneer—23. Kota—24. Reliance—25. Canus—26. Prelude—27. Huron—28. Ladoga.

Kernel Characters

The kernel characters which are most useful in distinguishing Canadian varieties are *(a)* colour, *(b)* length of kernel in relation to its width and *(c)* obliqueness of the germ face.

While kernel characteristics may vary somewhat under different environmental conditions, each variety has its own characteristic colour and shape.

FIG. VIII—Kernels of Marquis, Garnet, Reward, Ceres and Red Bobs 222 reading from left to right.

COLOUR: As already indicated, all varieties of spring wheat are divided into two main groups as regards colour, viz., Red and White. Within the former group may be found varieties which are dark red as in Reward, and others, such as Parker's, which normally may be described as light red. Between these two extremes may be found many varieties which differ only very slightly in colour.

In recent years, it has been found that the grains of certain varieties when immersed in a solution of phenol, take on different colours. Thus Marquis when treated, assumes a very dark brown colour, whereas Early Triumph remains practically unaffected.* These observations would seem to indicate the possibility of using these treatments as an aid in distinguishing varieties. The investigations, therefore, are being continued.

LENGTH-WIDTH RATIO: As in the case of the glumes, the length-width ratio of the grain, that is the length in relation to the width, appears to be a more satisfactory basis of comparison than are either the width or the length when considered independently. Thus certain varieties, such as Garnet and Huron, are usually longer in proportion to their width than are varieties such as Reward and Marquis. This fact makes it possible to distinguish four main shapes of kernel when the latter are normally developed, viz., *(a)* ovate or egg-shaped, *(b) elliptical, (c) oblong and (d) oval.*

GERM FACE: While the size and shape of the "face" of the germ or embryo are of little value from the standpoint of classification, the degree of "obliqueness" of the germ has proved of some value in a few cases. Thus, in Garnet, the obliqueness of the germ differs from that of most of the common varieties.

BRUSH: The small hairs at the tip of the kernel, commonly known as the brush, vary considerably in length and number in different varieties and frequently may be used to advantage.

* "Two New Methods of Distinguishing Canadian Wheats"—J. G. C. Fraser and F. Gfeller, Scientific Agr. 15/8/35.

MILLING AND BAKING QUALITIES

While environment may determine to a very large extent, the milling and baking qualities of wheat, yet each variety possesses certain inherent qualities which distinguish it from other varieties, and which can not be eliminated entirely by environmental influences. Thus Marquis, when grown in the better quality districts in the Prairie Provinces, possesses a quality of protein which imparts to the dough, tough and elastic properties which make wheat of this variety particularly desirable for blending with weaker wheats. On the other hand, Garnet possesses a quality of protein which is less elastic and tough than that of Marquis and therefore considered inferior to it in baking strength properties. Reward possesses protein of strong elastic properties, nevertheless it is not quite so tough in character as that of Marquis. However, the usually higher quantity of protein found in Reward wheat make this variety a desirable one from a quality standpoint, especially in areas such as in the northern parts of Saskatchewan and Alberta, where environmental conditions are not conducive to the production of highest quality of bread wheat. Certain varieties produce yellow flour. Some possess a very hard kernel texture, while others are characteristically soft even though high in protein content.

In hard red spring wheats, Marquis is recognized and accepted as the standard variety from a quality standpoint, and it is this variety upon which are based the official grades (Western Division) as designated by the Canada Grain Act. No variety considered to be of lower quality or of different milling characteristics than Marquis is admitted to the three top grades (No. 1 Manitoba Hard, No. 1 Manitoba Northern, and No. 2 Manitoba Northern). The varieties which are admitted at present into these three top grades are Marquis, Reward, Ceres, Red Fife, Renfrew, Pioneer, Early Triumph, Red Bobs 222, Supreme, Early Red Fife, Ruby, Renown, Apex, Regent, Redman and Thatcher. The varieties Kota, Kitchener, Preston, Huron, Stanley, Percy, Marquillo, Parker's Brownhead and Rescue cannot grade higher than No. 3 Manitoba Northern. The variety Garnet is given separate grades, namely, No. 1 C. W. Garnet, No. 2, C. W. Garnet, No. 3 C. W. Garnet. When excluded from these grades, it may be graded No. 5 Manitoba or lower, according to the quality or condition of the sample.

The white spring wheats, such as Quality, are grown to a very limited extent in Canada, as the red wheats, as a class, appear to be superior, all things considered.

VARIETIES RECOMMENDED

The varieties of wheat which have proved most suitable for the main wheat-growing regions throughout Canada to date are designated elsewhere, so will not be specified in the present bulletin. As time passes, and new varieties of proved merit come to compel attention, these recommendations doubtless will have to be changed. In the meantime, those concerned should keep in touch with the tests being conducted nearest their farms, and be guided by the results obtained therefrom.

APEX

*(C.A.N. 1857)

(Original Station Nos.: A. 75-1; Sask. 1703)

Origin: From a cross made at the University of Saskatchewan, Saskatoon, Sask., in 1927, between (H-44-24 × Double Cross) and Marquis.

Description: General shape and size of head very similar to Marquis but tip awns generally shorter; beaks slightly sharper; elevation of the shoulder greater than in Marquis with less narrowing of the shoulders towards the tip of the spike. Apex yields fully as well as Marquis under normal conditions but much better when rust is bad. Under practically all conditions it yields less than Thatcher in tests conducted thus far. It has proved highly resistant to stem rust, moderately resistant to bunt and loose smut, but susceptible to leaf rust.

Apex
C.A.N. 1857

In maturity there is no essential difference between Apex and Marquis but both are usually a few days later than Thatcher and Renown. The kernel of Apex resembles that of Marquis in all important respects. In strength of straw, Apex is slightly weaker than either Marquis or Thatcher especially in Manitoba, while in height it is slightly taller than the latter although somewhat shorter than Marquis.

A selection out of Apex (Sask. 1789) will probably be the basis of registered seed of this variety.

Milling and Baking Qualities: On the basis of extensive co-operative quality studies made during the years 1932 to date (1932-37) with this variety as grown in the three Prairie Provinces, it would appear safe to class Apex with Marquis as regards baking strength and flour colour.

In the drier areas where high protein wheat is produced it has been lower than Marquis in weight per bushel and flour yield and slightly lower in baking strength. In 1935, Apex suffered badly in bushel weight and flour yield when tested in Manitoba (5 points) and ranked lower than either Renown or Thatcher in these respects.

Distribution: Some 1,250 bushels of Apex were distributed in the rust areas of Saskatchewan in the spring of 1937. Unfortunately, the total returns for that year were rather low owing to the severe drought prevailing in most of the districts where sown. The season of 1938, however, was more favourable, and approximately 20,000 bushels of this variety were available for seeding in the spring of 1939.

*Canadian Accession Number.

AURORE

(C.A.N. 1218)

Origin: This variety originated in Australia from a cross made by Wm. Farrer between Jacinth a Colorado wheat and the Russian variety Ladoga. It was brought into Canada for testing in 1920 by the Cereal Division, Ottawa.

Description: Head of medium length, oblong and fairly dense; beardless except for a few short tip awns; chaff reddish brown and smooth, with square shoulders of medium width and with short actute beaks; kernels of medium length but rather narrow; maturing slightly earlier than Marquis; straw slightly shorter and weaker than the latter variety; susceptible to rust and and smut; not specially inclined to shatter.

Aurore
C.A.N. 1218

Milling and Baking Qualities: Aurore, as grown under Canadian conditions, produces a relatively poor quality of flour for bread-making purposes, being low in baking strength and yellow in colour.

Status and Distribution: A fair yielder, especially in the East, but its poor quality has prevented its becoming widely distributed. Except for a small section in Quebec, this variety never attained any degree of popularity.

AXMINSTER

(C.A.N. 1217)

Origin: Selected by the late Samuel Larcombe, of Birtle, Manitoba, about 1923, from Minister, an Australian variety.

Axminster
C.A.N. 1217

Description: Head beardless with smooth, white chaff; grain white, medium in size and hard in texture; matures a few days later than Marquis; susceptible to stem rust.

Milling and Baking Qualities: Axminster produces a flour of good baking strength but of very yellow colour.

Status and Distribution: This variety was grown for a few years at a few scattered points, mostly in Manitoba, but never gained any appreciable popularity.

53631—4½

BLUE STEM (Haynes)

(C.A.N. 1334)

Origin: A selection made by Mr. L. H. Haynes of Fargo, North Dakota, about 1895.

Blue Stem (Haynes)
C.A.N. 1334

Description: Heads long, medium lax, beardless; chaff white; pubescent; kernels red; medium to late maturity. Straw long, medium strong and bluish in colour; very susceptible to stem rust.

Milling and Baking Qualities: Limited tests on samples of this variety have indicated that Haynes Blue Stem is a good quality wheat for bread-making purposes.

Status and Distribution: This variety was grown quite widely for some years in the Dakotas and Minnesota starting with 1892, but never became popular in Canada.

BISHOP (Ottawa 8)

(C.A.N. 1233)

ORIGIN: Selected by the late Sir Charles Saunders from a cross made in 1891 between a Russian wheat Ladoga and an early Indian wheat Gehun.

BISHOP OTT. 8
C.A.N. 1233

DESCRIPTION: Head of medium length, beardless and rather dense at the tip; chaff smooth and white; grain white, of medium size and quite hard; straw medium long, strong.

MILLING AND BAKING QUALITIES: Bishop posesses good baking strength but the flour is usually more yellow than that of Marquis.

STATUS AND DISTRIBUTION: This variety has been tested widely since 1904 and has done well in many places but especially in the far north. Owing to its white colour, however, it never became popular commercially.

CANUS

(C.A.N. 1260)

Origin: Canus came from a cross made in 1918 at the University of Minnesota between Marquis, a spring wheat, and Kanred a winter wheat. The selection was isolated at the University of Alberta, Edmonton, by Dr. O. S. Aamodt in 1929, largely because of its resistance to foot-rots and covered smut.

Canus
C.A.N. 1260

Description: Head strongly bearded, fusiform and mid-dense; chaff white and smooth; beaks acute, $\frac{1}{4}''-\frac{3}{8}''$ in length; shoulder narrow with tendency toward elevation; kernels red, hard and more or less oblong; straw strong of medium length and white in colour; kernel is held tightly by the chaff; matures about the same time as Marquis; susceptible to stem rust but highly resistant to covered smut and foot-rot, and relatively resistant to spring frost in the seedling stage.

Milling and Baking Qualities: Canus resembles Reliance in being higher than Marquis in weight per bushel and flour yield but slightly lower in protein content and in baking strength. The flour is whiter than is that from Marquis.

Status and Distribution: Canus appears to be well adapted to the drier areas of south-central and eastern Alberta, and the west-central part of Saskatchewan. While not grown very extensively at present, it had considerable popularity in the above areas particularly.

CERES

(C.A.N. 1263)

Origin: This variety originated from a cross between Kota and Marquis, made at the North Dakota Experiment Station in 1918. It was introduced into Canada for trial by the Dominion Experimental Farm at Brandon, Manitoba, in 1924, from which Farm it later was made available for trial by farmers.

Ceres
C.A.N. 1263

Description: Bearded, chaff white and smooth, bearing slightly inturned beaks which are broadened at the base and which vary considerably in length from $\frac{1}{8}''$ to $\frac{1}{2}''$; kernels red but very susceptible to bleaching; straw not quite so strong as Marquis but of same length; ripens slightly ahead of Marquis and frequently excels it in yield of grain. Is more resistant than is Marquis to the common forms of stem rust but is not capable of withstanding a severe epidemic such as that of 1935. It is very susceptible to leaf rust and smut.

Milling and Baking Qualities: Ceres is a high quality spring wheat being classed with Marquis in this respect. Like Kota, it is particularly noted for the ability of its flour to absorb water.

Status and Distribution: Following its introduction, Ceres gained rapidly in popularity until 1935 when the severe rust epidemic of that year spelled its doom. Like Marquis and other varieties which are susceptible to stem rust, it is rapidly disappearing from those areas which are subject to this disease.

CORONATION

(C.A.N. 1914)

Origin: From a cross between Pentad and Marquis made by the Cereal Division staff located at the Dominion Laboratory of Cereal Breeding, Winnipeg, Manitoba.

Description: This variety matures in about the same length of time as Marquis, has bearded heads with awns which are usually quite stiff and spreading and about three to four inches in length. The head is fusiform and mid-dense, and varies from erect to inclined. The glumes are glabrous (smooth) white to yellowish in colour (often with dark blotches), mid-long and mid-wide; shoulders narrow to mid-wide and elevated; beaks narrow, about 2·4 mm. in length at centre of head but lengthen out towards tip. The kernels are red, hard, mid-long and somewhat elliptical to ovate; crease mid-wide and mid-deep; cheeks angular to rounded; germ mid-sized and brush mid-long to long. This variety is highly resistant both to stem rust and leaf rust, moderately resistant to loose smut but moderately susceptible to bunt.

Coronation
C.A.N. 1914

Milling and Baking Qualities: Milling tests indicate that this variety during the conditioning or tempering process, takes up water more slowly and requires more of it in order to reach optimum milling condition than do varieties like Marquis. The flour, on the other hand, takes up less water and the dough slackens off more quickly than does that of Marquis. For these reasons chiefly, Coronation has not been recommended for inclusion in the statutory grades of western grain.

Status and Distribution: Since Coronation is not admitted to the Manitoba Northern grades, it is not grown in Western Canada. In Eastern Canada, however, the variety has given a good account of itself and is now the variety generally recommended.

EARLY RED FIFE (Ottawa 16)

(C.A.N. 1288)

Origin: Early Red Fife is a pure line selection made at the Central Experimental Farm, Ottawa, in 1930 from Ordinary Red Fife. It was selected on account of its earliness, ripening as it does from one to three days ahead of its parent.

Description: Head rather long and dense with tendency toward a "club" tip; bearless except for a few short apical awns; chaff white, smooth and quite characteristic in that the keel is usually curved and the shoulders either very narrow or wanting; beaks heavier with less acute tips than in Marquis and more curved especially towards the apex of head; kernels red and rather large; maturing under ordinary conditions, two or three days later than Marquis; straw rather longer than Marquis but of similar strength; very susceptible to stem rust and shatters readily.

Early Red Fife Ott. 16
C.A.N. 1288

Milling and Baking Qualities: Early Red Fife is fairly satisfactory in milling and baking qualities although not quite equal to Marquis in baking strength.

Status and Distribution: This variety, at one time, had quite a wide-spread distribution especially in Western Canada. A fair yielder under most conditions but, on account, chiefly, of its susceptibility to rust and shattering, it has very largely disappeared.

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EARLY TRIUMPH

(C.A.N. 1291)

Origin: In 1910, Dr. Seager Wheeler of Rosthern, Saskatchewan, found a head of wheat bearing red kernels in Bobs, a white Australian variety which he had been growing previously near a plot of Early Red Fife. It is thought that this head originated as a result of a natural cross between Bobs and the latter variety. From the progeny of these seeds many plant selections were made and tested, to one of which ultimately was given the name Early Triumph.

Early Triumph
C.A.N. 1291

Description: Head absolutely bald, oblong and somewhat dense; chaff smooth and white; kernels red but inclined to "go starchy" under certain conditions; straw of medium length and of good strength; very susceptible to rust and smut.

Milling and Baking Qualities: Early Triumph ranks slightly lower than Marquis in baking strength but is classed among the high quality wheats.

It mills very freely and gives a relatively high yield of flour of quite good colour.

Status and Distribution: Ever since its introduction, about 1918, this variety has been fairly popular in certain areas of northern Saskatchewan and Alberta, although its tendency to produce starchy, low-protein grain under the environmental conditions peculiar to the North has retarded its wider extension in that area.

In more recent years, it has gained in popularity further south in Alberta and where the combine is used.

FEDERATION

(C.A.N. 1674)

Origin: Obtained from a cross made in New South Wales by Wm. Farrer, Australian wheat breeder, between Yandilla King and Purple Straw.

Description: Head beardless and practically devoid of apical awns; chaff smooth and brown; straw yellow and fairly strong; kernels short but broad, white, and soft in texture.

Federation
C.A.N. 1674

Milling and Baking Qualities: Federation produces a flour of medium baking strength and only fair colour.

Status and Distribution: Introduced into North American agriculture, chiefly during the period between 1914 and 1920, it attracted considerable attention although never grown commercially to any extent in Canada. In southern Alberta it held promise at first of becoming a popular combine wheat, but owing to its white berry and deficient baking qualities it has very largely disappeared.

GARNET (Ottawa 652)

(C.A.N. 1316)

ORIGIN: This variety is a result of a cross made at the Central Experimental Farm, Ottawa, in 1905, between the two Ottawa varieties Preston A. × Riga M.

DESCRIPTION: Head lax and bald except for a few short tip awns; chaff white, smooth, long and soft in texture; beak very fine and sharp, about $\frac{1}{8}''$ in length, usually longer, thinner and sharper than Marquis; straw white and of good length but not as strong as Reward; matures usually from one to three days earlier than Reward; the grain, which is usually longer and thinner than the latter variety, ripens and colours well in stook; very susceptible to rust but highly resistant to smut; shatters rather readily. The germ is set in the kernel at a very oblique angle.

GARNET OTT. 652
C.A.N. 1316

MILLING AND BAKING QUALITIES: Garnet exhibits somewhat different milling characteristics than Marquis, requiring as it does to be tempered or conditioned differently for best results. It also mills into a flour which is more yellow in colour than Marquis. Judged by crude protein content, loaf volume and a tendency toward a shortness in the dough, it is not entitled to rank with Marquis in baking quality.

The northern areas of Alberta and Saskatchewan where Garnet is most suited agronomically, are not conducive to the production of high quality wheat and under these conditions, the poorer baking strength of Garnet in relation to Reward is accentuated.

STATUS AND DISTRIBUTION: Since its distribution in the spring of 1926, Garnet has come to occupy an important place among the leading wheat varieties in those sections where early frosts are most feared. Garnet is graded into special grades which reduced its popularity, although in recent years it has enjoyed a good feed market.

HARD RED CALCUTTA

(C.A.N. 1332)

ORIGIN: This variety was brought into Canada sometime between 1886-1893 from India as a commercial sample of wheat and was very likely a mixed lot of seed, since at least two distinct forms are recognized.

HARD RED CALCUTTA
C.A.N. 1332

DESCRIPTION: Head bearded; chaff smooth and yellow; kernels red and of mid-season maturity; straw white and strong.

STATUS AND DISTRIBUTION: This wheat was never grown commercially in Canada. The description given is only of historical interest, this variety being one of the parents of Marquis.

HURON (Ottawa 3)

(C.A.N. 1344)

(Recommended for Eastern Canada)

ORIGIN: The result of a cross made at Ottawa in 1888 between White Fife and Ladoga.

HURON OTT. 3
C.A.N. 1344

DESCRIPTION: Head large and strongly bearded; chaff red and smooth with sharp beaks varying from $\frac{1}{8}''$ to $\frac{1}{4}''$ in length; kernels longer than Marquis but about the same colour; matures about with Marquis and is noted for its good yield; straw long and exceptionally stiff; susceptible to rust and smut; threshes easily but does not shatter unduly.

MILLING AND BAKING QUALITIES: Huron mills readily into a flour which usually is more yellow than that of Marquis and lower in baking strength. For these reasons it is considered inferior to Marquis in bread-making qualities.

STATUS AND DISTRIBUTION: Huron has become one of the most widely grown varieties in eastern Ontario, Quebec and the Maritime Provinces, but its supremacy is being seriously challenged by the rust-resistant variety Coronation. In Western Canada it is found occasionally, especially in central and northern Alberta, although not recommended for propagation in that section of the Dominion on account of its quality.

KITCHENER

(C.A.N. 1363)

Origin: Kitchener is a selection out of Marquis, made by Dr. Seager Wheeler, Rosthern, Sask., in 1911.

Description: Head bald except for a few very short tip awns; also quite compact with a tendency toward a flat "club" tip; chaff white, smooth and bearing shorter and coarser beaks than Marquis; kernels rather darker in colour and more oblong than Marquis; maturity about 2 to 3 days later than Marquis; straw usually long and at harvest time sometimes quite purple, especially at the nodes; good strength, very susceptible to rust. Does not shatter badly.

Kitchener
C.A.N. 1363

Milling and Baking Qualities: In general, Kitchener is considered somewhat inferior to Marquis, being lower in protein content and inferior in baking strength and flour colour.

Status and Distribution: This variety never occupied a very extensive acreage although it was grown here and there throughout the West to quite an extent at one time. To-day it is practically extinct in Canada as it has not proved as desirable a variety, generally speaking, as have varieties such as Marquis.

KOTA

(C.A.N. 1364)

Origin: This variety was found in a sample of durum wheat obtained in Russia in 1903 by Prof. H. L. Bolley, of North Dakota Agricultural College, and named Kota in 1919 by Waldron and Clark. The name is derived from the name of the state where it was first tested.

Kota
C.A.N. 1364

Description: Head bearded; chaff white and smooth, bearing long beaks varying from $\frac{3}{8}''$ to $1\frac{1}{4}''$ in length; can be distinguished from Preston by the longer glumes and beaks of the former; kernels have a full crease, are dull red in colour and bleach very readily in the wet seasons; matures slightly ahead of Marquis; straw fine, medium tall, but weak; partially resistant to the common forms of stem rust but very susceptible to smut and leaf rust.

Milling and Baking Qualities: The kernels are very hard in texture resembling those of durum and therefore require different treatment before milling. The flour is quite yellow and although of fair quality, it is inferior to Marquis in baking strength.

Status and Distribution: This variety, introduced into Manitoba about 1921, met with some favour for the first few years after its introduction, but, on account of its susceptibility to loose smut, bunt and leaf rust; and to its weak straw and relatively poor yield, it has practically disappeared.

LADOGA

(C.A.N. 1386)

Origin: In 1886, Dr. Wm. Saunders obtained for trial in Canada varieties of wheat from all parts of the world with the hope that he might find one capable of ripening earlier than Old Red Fife and which would also be satisfactory from the standpoint of yield and quality. One of the most promising varieties included in this collection was one obtained from near Lake Ladoga in Russia, latitude 60° N. This was named Ladoga.

Ladoga
C.A.N. 1386

Description: Head bearded; chaff brown and smooth; kernels dark red, medium sized and hard in texture; the crease is usually angular and mid-deep; matures about 10 days earlier than Red Fife; the beaks longer than those of Huron and varying from 1 to 5 mm. in length.

Milling and Baking Qualities: Ladoga mills into a flour of rather low baking strength and flour colour and is, therefore, not a desirable variety to be grown in the Prairie Provinces.

Status and Distribution: A distribution was made of this variety to over 700 farmers in the Prairie Provinces from 1888 to 1893. Its chief claim to a place was based on its ability to mature about a week earlier than Red Fife which was then commonly grown. Tests, however, proved that this variety had poor milling qualities and its further distribution was discouraged. It is seldom found growing at the present time although frequently found in mixtures. It was used quite extensively as a parent in breeding work in the early days.

MARQUIS (Ottawa 15)

(C.A.N. 1396)

Origin: Marquis is a descendant of a cross made in 1892 by officials of the Central Experimental Farm, Ottawa, Ontario, between an early ripening wheat, obtained from India under the name of Hard Red Calcutta, and Red Fife. It was isolated in 1903 by the late Sir Charles E. Saunders, then Dominion Cerealist, and was first sent to Western Canada for trial on branch farms in 1907.

Description: Head beardless; chaff white and smooth and held more closely than in Red Fife; kernels red and hard; medium early maturity; straw stiff and of medium length; susceptible to rust *(Puccinia graminis tritici)*.

Marquis resembles Red Fife quite closely, being distinguished chiefly by shape and density of head, "spread" of tip awns, shape of glumes and length of "beak." It also requires from a week to ten days less than Red Fife to ripen.

Marquis Ott. 15
C.A.N. 1396

Milling and Baking Qualities: When grown under favourable conditions, Marquis mills freely into a flour of good colour which in turn produces strong elastic doughs of the best type not only for baking into "well piled" loaves but for blending with weaker wheats.

For many years, this variety has been taken as the standard of quality upon which the highest grades of wheat are based.

Status and Distribution: The ability of Marquis to mature several days earlier and to resist lodging better than Red Fife, coupled with its superior yielding capacity, caused it to supersede the latter variety with amazing rapidity until it occupied, by 1928, probably 80-90 per cent of the area devoted to spring wheat in Western Canada. Since that date, however, it has been superseded in Manitoba by Regent, Thatcher and Renown, and in northern areas of the Prairie Provinces by Thatcher, Garnet and Red Bobs. It has been grown to a limited extent in Eastern Canada and in British Columbia.

The phenomenal success of the new rust-resistant varieties since their first introduction in 1936 has resulted in driving Marquis completely out of those areas where rust is liable to occur to any serious extent.

MONTANA KING (Broatch's Brownhead)

(C.A.N. 1696)

ORIGIN: This variety originated as a selection made by J. W. Broatch, Moose Jaw, Saskatchewan.

DESCRIPTION: Head bald with short apical awns; chaff brown or red, smooth; beaks short and acute; kernels red and hard; straw of medium length and strength, white in colour; matures somewhat later than and is inferior in yield to Marquis; susceptible to stem rust, loose smut and bunt.

MONTANA KING OR BROATCH'S BROWN HEAD
C.A.N. 1696

MILLING AND BAKING QUALITIES: Inferior to Marquis in milling and baking qualities.

STATUS AND DISTRIBUTION: This variety never had a wide distribution in Canada, but this was not the case for one or two years in Montana and parts of North and South Dakota.

PACIFIC BLUE STEM

(C.A.N. 1854)

ORIGIN: Pacific Blue Stem is said to have come to the United States from Australia about 1852 bearing the name White Lammas.

PACIFIC BLUE STEM
C.A.N. 1854

DESCRIPTION: Head beardless, long and mid-dense; chaff smooth and yellow; kernels medium sized, white and soft in texture; glumes and shoulders wide with characteristic blunt beaks; matures somewhat later than Marquis and is susceptible to stem rust.

MILLING AND BAKING QUALITIES: Pacific Blue Stem mills into a flour low in strength for bread-making but is apparently better suited to the cake and pastry trade.

STATUS AND DISTRIBUTION: While this variety is well known and quite widely grown in the United States of America bordering on the Pacific Ocean, it is not grown in Canada except in a few scattered districts in British Columbia.

PARKER'S SELECTION

(C.A.N. 1460)

Origin: A selection made from Marquis by J. L. Parker of Gilbert Plains, Manitoba, in 1921.

Parker's Sel.
C.A.N. 1460

Description: Head somewhat more oblong and dense than Marquis; chaff smooth and yellowish white; kernels rather lighter in colour than Marquis; straw medium long and strong; shows a slight resistance to some of the forms of stem rust.

Milling and Baking Qualities: This variety mills into a flour of very yellow colour but in other particulars is fairly satisfactory.

Status and Distribution: While fairly popular in the area of its origin, it does not seem to have attained any wide distribution. Since the introduction of rust-resistant varieties, this variety has been forced to a position of relative obscurity.

PERCY (Ottawa 2)

(C.A.N. 1468)

Origin: This variety was derived from a cross made by the late Dr. W. Saunders, Central Experimental Farm, Ottawa, between Ladoga and White Fife in 1888 and, therefore, has the same parentage as Huron.

Percy
C.A.N. 1468

Description: Head long and beardless; chaff white and smooth; kernels red and hard; ripens slightly later than Marquis.

Milling and Baking Qualities: Inferior to Marquis in milling and baking qualities.

Status and Distribution: On account of its lower baking qualities and its inability to ripen as early as Marquis or Reward, Percy has practically disappeared from cultivation in Canada.

PIONEER (Ottawa 195)

(C.A.N. 1467)

Origin: Obtained from a cross between Riga and Preston, made in 1903 at the Central Experimental Farm, Ottawa, Canada. It is a full sister of Garnet.

Description: Head bearded; chaff whitish-yellow and smooth; kernels dark red and hard; matures about 10 days ahead of Marquis and Huron; straw mid-long and of only medium strength. Under ordinary conditions, the straw is white, but, sometimes when fully ripe, it assumes a purplish hue. The variety is easily distinguished in the heading stage by the mottled colour of the stem and leaves.

Pioneer
C.A.N. 1467

Milling and Baking Qualities: Produes flour of good colour and strength.

Status and Distribution: This variety was distributed for trial in the Prairie Provinces between 1915-1919, but on account of its somewhat weak straw and the unsatisfactory yields realized due to heads breaking off and shattering, it never became very popular and is now seldom found.

PRELUDE (Ottawa 135)

(C.A.N. 1481)

Origin: This variety originated from a cross between Downy Gehun and Fraser, made at the Central Experimental Farm, Ottawa, in 1903.

Description: Head of medium size, bearded; awns quite dark in colour especially toward the base; chaff yellowish and hairy; kernels dark red in colour and of exceptionally high weight per bushel; threshes very easily; straw short and fine and of good strength. This is the earliest of the well known wheats in Canada.

Prelude
C.A.N. 1481

Milling and Baking Qualities: While usually higher in protein content than Marquis, it is not quite its equal in baking strength and flour colour.

Status and Distribution: This variety has not been grown extensively in Canada, being confined chiefly to the more northerly areas where extreme earliness is a prime requisite. Even here, it is met with only rarely at the present time, its relatively low yields accounting largely for its unpopularity.

PRESTON (Ottawa 4)

(C.A.N. 1482)

Origin: Preston came from a cross made in 1888 by the late Dr. Wm. Saunders, first Director of the Central Experimental Farm, Ottawa, between Ladoga and Red Fife.

Description: Head strongly bearded; chaff white and smooth; beaks sharp, about $\frac{1}{8}''$ in length; kernels red and hard; straw of medium length and strength and generally white in colour although, under certain conditions, exhibits a reddish purple coloration around the lower nodes; grain held rather loosely in the head; matures about the same time as Marquis.

Preston
C.A.N. 1482

Milling and Baking Qualities: Slightly inferior to Marquis in baking strength and decidedly more yellow in flour colour.

Status and Distribution: By 1895, this variety had obtained a fairly wide popularity and for several years was grown quite extensively in both Canada and in the United States. Its susceptibility to stem rust and its lack of the desired milling qualities have been responsible in large part for its replacement in Canada by better varieties.

QUALITY

(C.A.N. 1490)
(Not recommended for Hard Red Spring wheat areas)

Origin: Produced by the late Luther Burbank of Santa Rosa, California, about 1918.

Description: Head beardless; chaff smooth and white; straw medium length and strong; kernels white, hard, larger than those of Marquis and generally plump; ripens with Reward; susceptible to stem rust.

Quality
C.A.N. 1490

Milling and Baking Qualities: One of the best of the white spring wheats in milling and baking qualities.

Status and Distribution: Owing to the extravagant claims made regarding its wide adaptability, high quality and productivity this variety attracted wide attention especially in Manitoba, where it became fairly widely distributed. Being a white wheat and very susceptible to rust as well as to sprouting in the stook its popularity waned rapidly until to-day the acreage devoted to its production is negligible.

RED BOBS 222

(C.A.N. 1637)

Origin: A reselection of Early Triumph made at the University of Alberta, Edmonton, and first distributed about 1925.

Description: This variety is indistinguishable from Early Triumph.

Milling and Baking Qualities: As a result of numerous comparisons made between this variety and Early Triumph, it would appear that there is no significant difference in quality between the two. Red Bobs 222 has been extensively tested for a number of years and has proved to be a high quality variety in the better wheat growing areas of Alberta and Saskatchewan where rust does not occur. It becomes quite starchy in the wooded areas of northern Alberta and Saskatchewan and, although about equal to Marquis in baking strength, when grown in these areas it is substantially below Reward. In flour yield, it is slightly superior to Marquis and equal to it in flour colour.

Red Bobs 222
C.A.N. 1637

Status and Distribution: The distribution of this particular selection has been confined chiefly to Alberta, in which province it gained considerable popularity especially in the southern areas where the combine harvester, to which it seems well adapted, is largely used.

RED FIFE

(C.A.N. 1515)

Origin: Red Fife was introduced into Canada through a shipment of wheat originating in Danzig, Germany, a sample of which was sent to Mr. David Fife, of Peterboro, Ontario, by a friend in Glasgow in 1842. This sample, sown in the spring, turned out to be almost all winter wheat, but a few kernels proved to be typical spring wheat and their progeny was saved. These were the progenitors of Red Fife.

Red Fife
C.A.N. 1515

Description: Head beardless except for a few tip awns, one of which is considerably longer than the others; chaff white and smooth; kernels red and hard; glumes bearing more sloping shoulders and shorter beaks than those of Marquis; straw of fair length and strength; late maturing but productive; very susceptible to stem rust and bunt.

Milling and Baking Qualities: Red Fife is the equal of Marquis in all essential milling and baking characteristics.

Status and Distribution: This variety, chiefly because of its late maturity and susceptibility to rust, quickly fell into the discard with the introduction of Marquis. It is now seldom found except in mixtures.

REDMAN

(C.A.N. 3633)

Origin: From a cross between Regent and Canus made in 1934 by the Cereal Division staff located at the Dominion Laboratory of Cereal Breeding, Winnipeg, Manitoba.

Redman
C.A.N. 3633

Description: Head beardless with apical awnlets slightly longer than those of Regent. Chaff yellow, (somewhat deeper in colour than Regent) and smooth. Spikelets almost straight in arrangement, less zig-zag than Regent. Straw strong and of same height as Regent. Like Regent in general appearance but heavier straw and larger, more rugged head. Kernels dark red in colour, rather large and rough in appearance. Matures about a day earlier than Thatcher and a day later than Regent.

In the three years 1943-45 Redman has excelled Regent in yield in the three Prairie Provinces and Thatcher in Manitoba. It has yielded slightly less than Thatcher on the average in Saskatchewan and Alberta.

Redman is resistant to stem rust, bunt and black chaff, and somewhat more resistant than Regent to leaf rust, loose smut and root-rot.

Milling and Baking Qualities: Redman ranks with Marquis and Thatcher in quality.

Status and Distribution: Redman was recommended for licence in the spring of 1946. Approximately 1,000 bushels of seed were available to be increased under control for general distribution in 1947.

REGENT

(C.A.N. 1902)

Origin: Obtained from a cross made by Cereal Division Officials of the Dominion Department of Agriculture, at the Dominion Laboratory of Cereal Breeding, Winnipeg, from a cross between H-44 and Reward. This is one of the most promising rust resistant wheats so far developed. Prior to 1939 it was known as R.L. 975·1.

Regent
C.A.N. 1902

Description: Head beardless, chaff white and smooth, mid-dense and inclined to be slightly ragged with a few tip awns; straw medium strong and slightly taller than Thatcher as a rule. Kernels dark red in colour, rather large and rough in appearance; matures in about same period of time as Renown and Thatcher, and two or three days ahead of Apex. Regent is resistant to stem rust, leaf rust and covered smut. It is definitely superior to Apex, Renown and Thatcher in leaf rust resistance. Regent has been a close competitor of Thatcher from a yield standpoint, but has been slightly higher yielding than either Renown or Apex. In 1938 it out-yielded the other three varieties where leaf rust was prevalent.

Milling and Baking Qualities: Regent is slightly superior to Renown and Apex in baking strength. In flour colour, Regent is in the same category as Marquis, Reward and Apex, and therefore superior to the original strain of Renown and Thatcher.

Status and Distribution: Regent was licensed in the spring of 1939. The initial distribution, consisting of approximately 11,000 bushels, was made to farmers chiefly in Manitoba and eastern Saskatchewan.

RELIANCE

C.I. 7370, Sask. 1851 (C.A.N. 1498)

Origin: Reliance was developed by the United States Department of Agriculture in co-operation with the Oregon, California, Montana, North Dakota, and Minnesota Experiment Stations from the cross Kanred × Marquis made in 1917.

Reliance
C.A.N. 1498

Description: Head bearded; chaff white and smooth; beaks sharp, averaging about $\frac{1}{8}''$ in length; kernels red and hard; straw of medium length, strong and generally white in colour; grains held moderately firmly in the head; matures about the same time as Marquis; vigorous in growth and high in yield.

Milling and Baking Qualities: Reliance is usually higher than Marquis in weight per bushel and in percentage yield of flour but slightly lower in percentage protein and in baking strength. The flour is slightly yellower than that of Marquis.

Status and Distribution: Recommended first in 1933 by the Saskatchewan Seed Board for trial in southwestern Saskatchewan on account of its relatively high yielding capacity under drought conditions, this variety has become fairly widely distributed although the total acreage occupied is small.

RENFREW

(C.A.N. 1514)

Origin: This variety was developed by the Department of Agronomy, University of Alberta, in 1918, as a selection out of Marquis.

Description: Head beardless; chaff white and smooth; kernels red and hard; straw very long and quite strong; ripens usually 3 to 5 days later than Marquis; head usually longer and more open than Marquis; glumes long and shoulders square with very short acute beaks.

Renfrew
C.A.N. 1514

Milling and Baking Qualities: Renfrew compares favourably with Marquis in all essential milling and baking characteristics.

Status and Distribution: For a few years, this variety was rather popular in parts of Alberta and Saskatchewan but its late maturity has gradually brought about its practical extinction.

RENOWN

(C.A.N. 1856)

Origin: From a cross made by the Cereal Division staff located at the Dominion Laboratory of Cereal Breeding, Winnipeg, Manitoba, in 1926, between H–44–24 and Reward.

Description: General shape and size of head fairly similar to that of Marquis but arrangement of spikelets more inclined to be irregular (zig-zag) as in the Reward parent; glumes, including shoulders and beaks, very similar to Marquis; kernels more of the Reward type and weighing slightly more than those of Marquis; matures mid-way between Reward and Marquis at most western points; straw strength essentially in same class as Marquis in most districts but length of straw slightly less; straw frequently takes on a purplish colour at maturity. Renown yields as well as Marquis in most sections of Manitoba under normal conditions but very much better when rust is bad. It yielded less than Thatcher in tests conducted in all three provinces during the five years, 1933-37, and less than Marquis in west-central Saskatchewan and in Alberta where rust does not occur. In 1938, it did better than Thatcher in many sections, owing, presumably, to its greater resistance of leaf rust.

RENOWN
C.A.N. 1856

This variety has proved highly resistant to stem rust and stinking smut and moderately resistant to loose smut and leaf rust. A selection out of Renown (No. 716·6) is highly resistant to leaf rust. This latter strain will be the basis of all registered seed of this variety.

Milling and Baking Qualities: Renown has been extensively studied in co-operative tests to date (1932-38). The grain has a particularly good appearance, comparing well with Marquis in this respect. It has been high in weight per bushel and flour yield. Baking strength as expressed by loaf volume has been higher than that of Marquis where grown in southern Manitoba but somewhat lower in the high protein areas of central Saskatchewan. The dough characteristics resemble the Reward parent more than Marquis as regards toughness and resiliency. The flour colour is not quite as white as is that of Marquis, although the new selection is better in this respect.

Status and Distribution: The first distribution of this wheat took place in the spring of 1937 when a total of 6,310 bushels went to 1,765 farmers in Manitoba and eastern Saskatchewan.

RESCUE

(C.A.N. 3567)

Origin: Obtained from a cross between Apex and S–615, made in the greenhouse of the Cereal Division, Central Experimental Farm, Ottawa, in February 1938. The resultant population was transferred to the Cereal Breeding Laboratory, Dominion Experimental Station, Swift Current, Saskatchewan, for exploitation. Here plant breeders in co-operation with the Division of Entomology, Science Service, produced Rescue formerly known as S.C. 4188.

Description: Rescue has the distinction of being the first bread wheat to be introduced which is capable of resisting the attacks of the wheat stem sawfly (*Cephus cinctus* Nort.) to a high degree. General shape and size of head very similar to Apex; shoulder slightly elevated; kernels larger and brighter than Thatcher with less tendency to bleach; bushel weight is heavier. Straw slightly longer than Thatcher and medium strong under conditions in the Great Plains area but definitely weak in black soil zones. Rescue is slightly later than Thatcher but earlier than Marquis. Resistant to stem rust but susceptible to leaf rust and bunt and moderately susceptible to root-rot; easier to thresh than Thatcher but no shattering has been observed in the field. In yielding ability it is somewhat lower than Thatcher but where damage from sawflies is great, it is definitely superior.

Rescue
C.A.N. 3567

Milling and Baking Qualities: Rescue produces a more tender dough than does Marquis and is lower in water absorption. It is more creamy in flour colour than Marquis. For purposes of grading it is considered not equal to Marquis in quality and cannot be graded higher than Manitoba 3 Northern.

Distribution: Approximately 7,000 bushels of Rescue are being distributed to District Experimental Substations and selected growers in the sawfly area in the spring of 1946 for propagation.

REWARD OTTAWA 928

(C.A.N. 1509)

Origin: Reward is the result of a cross made in 1912 at the Central Experimental Farm, Ottawa, between Marquis and the very early maturing variety Prelude. It was first released for trial by farmers in 1928.

Description: Head rather "ragged" in appearance and bald except for a few short tip awns which are dark in colour toward the base; chaff white with a sparse covering of very fine hairs; kernels hard, very plump and dark red when fully ripened but otherwise have a tendency toward a greenish bronze cast which not infrequently degrades the sample; straw medium long and very stiff; suffers less than Marquis from attacks of stem rust; matures five to eight days earlier than Marquis; threshes easier than Marquis but does not shatter readily; quite susceptible to both loose smut and bunt.

Reward
C.A.N. 1509

Milling and Baking Qualities: Reward excels in those characteristics which distinguish a good wheat of the Manitoba Northern type. It is consistently higher than Marquis in weight per bushel, protein content and baking strength.

Status and Distribution: Reward enjoys an enviable reputation as an early wheat and as a wheat of unusual quality and weight. Unfortunately, it falls short in yielding ability except in certain more or less restricted areas such as the Red River Valley and in certain sections of the Park Belt across the north. Since its introduction, it has been a consistent championship winner at the International Hay and Grain Show at Chicago and at other seed exhibitions.

RUBY (Ottawa 623)

(C.A.N. 1511)

Origin: This variety arose from a cross made at the Central Experimental Farm, Ottawa, in 1905 between Downy Riga, an Ottawa-bred variety, and Red Fife D.

Description: Head beardless; chaff whitish-yellow, smooth; kernels dark red, hard and medium to small in size but of good weight per measured bushel; straw purple when ripe; matures earlier than Marquis by seven to ten days; shatters badly.

Ruby Ott. 623
C.A.N. 1511

Milling and Baking Qualities: Ruby compares favourably with Marquis in milling and baking characteristics.

Status and Distribution: Ruby was first distributed in 1917 during the Great War when every effort was being made to produce more wheat. For a few years it was quite widely grown especially in areas where a very early wheat is a distinct advantage. Following the introduction of Reward and Garnet, which latter varieties proved more profitable to grow, Ruby gradually disappeared until to-day it is found only very occasionally.

STANLEY (Ottawa 5)

(C.A.N. 1536)

Origin: This is the result of a cross made at the Central Experimental Farm, Ottawa, Ont., in 1888 between Ladoga and Red Fife. It is, therefore, a sister of Preston.

Stanley
C.A.N. 1536

Description: Head beardless; chaff red and smooth; kernels dark red, fairly long and fairly hard in texture; the crease rather deep as a rule; straw moderately strong; matures somewhat later than Marquis.

Milling and Baking Qualities: Stanley is inferior to Marquis in baking strength and flour colour.

Status and Distribution: This variety was first distributed in the nineties but never became very widely established. With the introduction of Marquis, it was forced to take a very secondary place while Garnet and Reward following later almost completed its elimination.

SUPREME

(C.A.N. 1543)

Origin: This variety originated from a plant selected out of Bobs, a white Australian wheat, by Dr. Seager Wheeler, of Rosthern, Saskatchewan in 1910. It is believed to have arisen as the result of a natural cross between Bobs and Early Red Fife, which latter variety was the leading one grown by Dr. Wheeler at the time.

Description: Head absolutely bald; chaff white and smooth; kernels dark red, hard and of medium size; straw of fair length and good strength; matures from three to six days ahead of Marquis as a rule; very susceptible to stem rust and bunt.

Supreme
C.A.N. 1543

Milling and Baking Qualities: Supreme mills freely and gives a high yield of flour of good colour. It is slightly lower than Marquis in crude protein content but compares favourably with it in baking strength.

Status and Distribution: This variety came fairly widely distributed outside of the rust area but has not attained the popularity of its sister varieties, Early Triumph and Red Bobs 222.

THATCHER (Minn. 2303)

(C.A.N. 1820)

Origin: Thatcher was produced from a cross made in 1921 at the Minnesota Agricultural Experiment Station, University of Minnesota, St. Paul, Minnesota, between (Marquis × Iumillo) × (Marquis × Kanred). The primary aim was to obtain a wheat of high quality for milling and baking purposes that was resistant to black stem rust and of desirable agronomic type. From one of the original crosses (Marquis × Iumillo), a bread wheat type was obtained with a considerable degree of resistance to stem rust under field conditions. From the Marquis × Kanred cross, a spring wheat was selected of good milling and baking quality that was immune to several forms of black stem rust and had high yielding ability. Thatcher originated from a cross between these two.

Description: Head resembles Marquis fairly closely but is somewhat shorter and denser. It also has a tendency to be slightly crooked or "twisted"; chaff white and smooth; glumes oblong in shape and about twice as long as wide; shoulders square; beaks acute, about 1/16″ long, broad at the base and curving inwards; kernels red and hard but smaller than Marquis and usually somewhat dull in colour; straw of medium length, exceptionally strong and white in colour; matures a few days earlier than Marquis, resistant to most forms of black stem rust in the field but very susceptible to bunt and leaf rust. Outyielded all varieties of common wheat with which it was compared in official tests, including Marquis, Renown and Apex, up to and including 1937. In 1938, an early and severe attack of leaf rust reduced the yield and grade of Thatcher somewhat in many parts of Manitoba and Saskatchewan. In these places, Renown proved more satisfactory.

Thatcher
C.A.N. 1820

Milling and Baking Qualities: Has a tendency to be lower in test weight per bushel than Marquis but this is not reflected in flour-yielding capacity. It readily conforms to the usual methods of conditioning Marquis-type wheats but the flour is somewhat higher in yellow pigment content. It is characterized by comparatively high water absorption, high baking strength but loaf crumb colour is somewhat more yellow than Marquis.

Status and Distribution: Released in Minnesota in the spring of 1934 when 2,000 bushels were distributed by the Minnesota Experiment Station to approved members of the Crop Improvement Association. Licensed for sale in Canada in 1935 following a number of years of careful testing. In that year, 8,000 bushels were grown in Manitoba which, together with 16,151 bushels imported from Minnesota, were distributed for seeding in 1936. It is estimated that Thatcher occupied approximately 37 per cent of the wheat acreage in Manitoba, 77 per cent in Saskatchewan and 20 per cent in Alberta during the 1945 season.

TYPE I c (Red Fife H)

Origin: A selection out of common Red Fife made many years ago at the Central Experimental Farm, Ottawa.

Description: Head similar in many respects to that of Early Red Fife, being beardless, oblong and fairly dense with a tendency toward a heavy or "clubbed" (clavate) tip; chaff white and smooth with rather wide, sloping shoulders and with short, broad beaks with rounded and slightly curved tips; matures slightly later than Marquis, straw about same length but weaker and more susceptible to both stem and leaf rust.

Type I c (Red Fife H)

Milling and Baking Qualities: Considered in about the same class as Marquis.

Status and Distribution: This wheat became distributed fairly widely in the Prairie Provinces as a mechanical mixture in Marquis, dating from about 1922, and to-day is one of the most frequent impurities found in the latter variety. It is sometimes found in a relatively pure state, having been slected and propagated by the occasional farmer. It is not now a recognized commercial variety.

VERMILION

(C.A.N. 1554)

Origin: A selection made in 1919 by F. H. Larcombe, of Minburn, Alberta, from a field of Early Red Fife, probably the result of a natural cross between Early Red Fife and some red-chaffed variety such as Huron.

Description: Head bearless and very suggestive of Early Red Fife in shape; chaff red and smooth resembling Early Red Fife quite closely except in colour; kernels light red and hard; straw long but of only fair strength, very susceptible to rust; maturity late.

Vermilion
C.A.N. 1554

Milling and Baking Qualities: Vermilion is decidedly inferior to Marquis in milling and baking qualities for bread-making purposes. The gluten lacks stability, elasticity and resilience; classed as a very poor milling wheat.

Status and Distribution: This variety never became widely distributed owing chiefly to its late maturity, weak straw and poor quality.

WHITE FIFE (Ottawa 11)

(C.A.N. 1560)

Origin: A selection made from the original White Fife by the Central Experimental Farm, Ottawa, in 1903. The latter variety is believed to have originated as a selection from ordinary Red Fife from which it differs only in colour of bran.

White Fife
C.A.N. 1560

Description: Head beardless and tapering, resembling Red Fife; chaff smooth and white with few apical awns; kernels white, hard and of good quality; matures at the same time as Red Fife; susceptible to stem rust.

Milling and Baking Qualities: White Fife is similar in quality to Red Fife and, therefore, a wheat of high milling and baking characteristics.

Status and Distribution: This variety was once quite popular in eastern Ontario and the Martitime Provinces but is now seldom seen anywhere in Canada.

WHITE RUSSIAN

(C.A.N. 1567)

Origin: This variety originated as a selection out of Red Fife and was first grown at Ottawa in 1889 and at the Indian Head Experimental Farm in 1891. It is known under a number of names, amongst which Wellman's Fife is perhaps the most common.

White Russian
C.A.N. 1567

Description: Head beardless, long and open; chaff white and smooth; kernels red and hard; straw very long and fairly strong; differs from Red Fife chiefly in length of straw and denseness of head; matures about the same time as Red Fife.

Milling and Baking Qualities: Inferior to Marquis for milling into flour for bread-making purposes.

Status and Distribution: Grown to a limited degree in New Brunswick, Nova Scotia and Prince Edward Island but practically unknown in the Prairie Provinces.

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